Leica Industrial Fluid Tester

Instruction Manual

1.0 INTRODUCTION

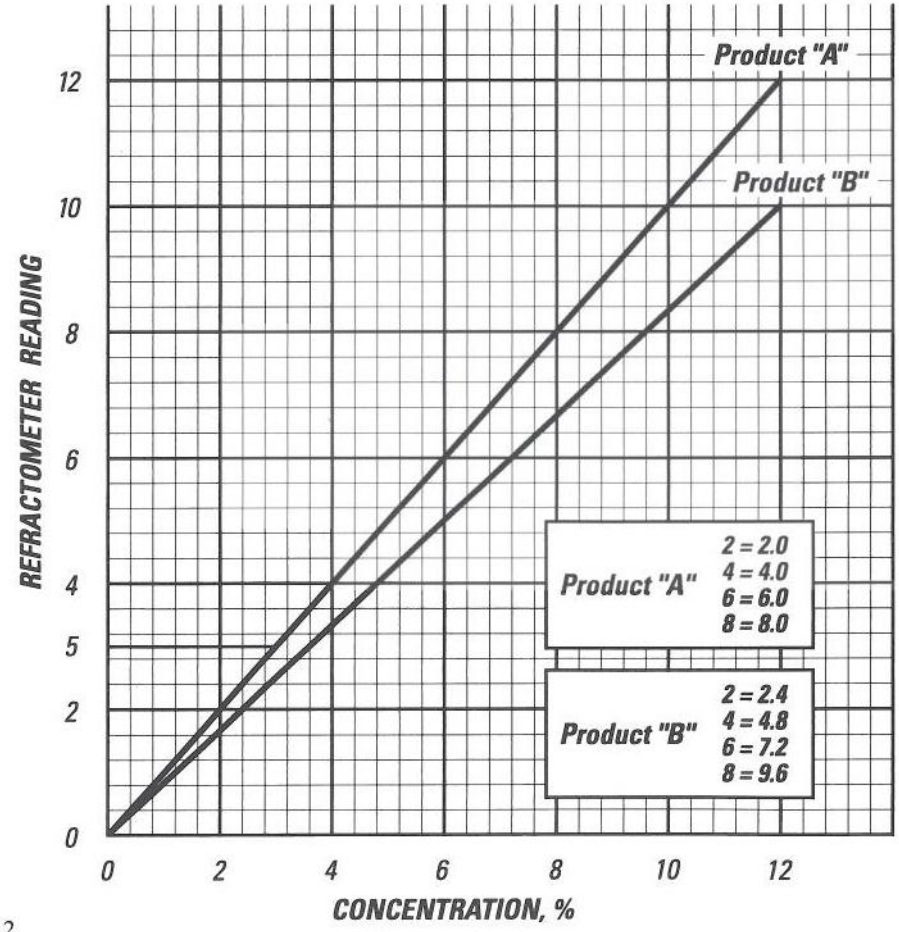
For the use and care of the Leica automatic temperature compensated hand refractometer, model 10441.

In recent years, industry has found practical applications for the Leica temperature compensated refractometers from Leica. In metal working, for example, the hand refractometer is used in determining total solubles in aqueous solutions of cutting fluids and quenching solutions used in heat treating.

The instrument is automatically temperature compensated for temperatures between 65°F (18°C) and 95°F (35°C) so that the reading need not be adjusted for either the temperature of the sample of the temperature of the room in which it is used.

The Model 10441 scale, designed for the measurement of synthetic cutting and grinding fluids, is in Brix units 0 to 10°.

Before using, contact the manufacturer of the solution to obtain graphs showing the characteristics of this product. These graphs, plotted to known values, will allow you to make instantaneous visual checks of unknown concentrations of the product. It is possible to calibrate your instrument by the method shown in the following chart, however, it is recommended that exact values for each product be obtained from the manufacturer. To calibrate, prepare three to five accurately measured known solutions (e.g. 2-4-6-8-10%). Determine their values by using the hand refractometer. Plot a chart with refractometer readings on the vertical y-axis and know values on the horizontal x-axis. Thereafter unknown solutions can be read in concentration to an accuracy of .25%. For example in the chart below, if an unknown solution has a refractometer reading of 5, this reading is equal to 5% for product "A" or 6% for product "B".



2.0 OPERATION

1. Hold the instrument in a horizontal position as shown in Fig. 1. Lift the cover plate

(A) to expose the prism and, using the dipstick, (B) place a few drops of the sample on the face of the prism. (C)

It is preferable to obtain the sample from the work area rather than from a reservoir so that any contaminants in the liquid will be better dispersed. To prevent scratching the prism face, always use the dipstick which is provided. In the absence of the dipstick, do not use glass, metal or the fingers. A common plastic stirring rod is a good substitute. Unfinished wood is not suitable since it may absorb some of the water in the specimen and give an incorrect reading. To reduce evaporation to a minimum, close the cover plate over the prism without delay.

2. To hold the instrument for reading, keep the cover plate in contact with the prism and point the instrument toward a window or other illuminating source. Look through the eye-piece and take the reading at the point where the dividing line between light and dark crosses the scale.

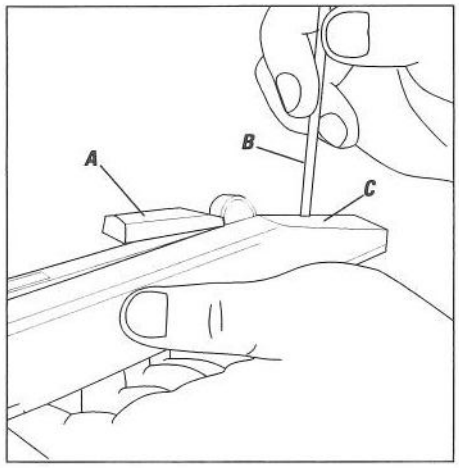


Fig. 1

Until one has had sufficient experience to immediately recognize the optimum contrast obtainable between light and dark boundary, the instrument should be tilted with respect the light source until best results are obtained. Good daylight or artificial light is adequate to illuminate the scale. Distant fluorescent light is sometimes inadequate.

3. Use a soft cloth or soft tissue paper moistened with water for wiping the prism and cover plate. Dry the prism and cover plate with a soft cloth or tissue. If the prism surface or cover plate is not well cleaned before the next sample is loaded an erroneously or fuzzy reading will result. Do not use hot water and never use gritty cleaning compounds to clean the prism. NEVER EXPOSE THE INSTRUMENT TO TEMPERATURES ABOVE 150°F.

2.0 ACCURACY

All instruments are factory calibrated and the adjustments are sealed. You may check the accuracy of your instrument by using distilled water as a sample. This should hive you a reading of zero. It is possible that dropping the instrument might shift the components sufficiently to introduce an error on the scale. This can be corrected by returning the instrument to the factory. You should consult with your dealer or with Leica for instructions on returning your Leica Fluid Tester.

Sharpness of the dividing line in all refractometers is affected by the product measured. Undissolved solids have very limited effect. Color, except extreme, is of little significance.